

The Life Cycle of Laminitis

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The laminitis disease is termed serious, complicated, and often times life threatening. Treatment procedures vary from medical assistance to mechanical treatments, or combinations of both. Opinions of the urgency in which to apply mechanical treatment devices shares wide spread views, as does medical treatment. Most practitioners who are serious about treating laminitis have developed a workable combination of mechanics and medication that has given them their best results. Usually their treatment is based on trial and error, and success and failure. Many hoof and health care professionals have become discouraged by the results they have received by using conventional protocol. This is understandable in view of the complex nature of the disease.

Over the past 40 years of my farrier practice, I've been involved in caring for a large number of acute and chronic laminitis victims. I've developed a worthwhile sense or insights as to what needs are important to the horse for survival and hoof restoration with this potentially hopeless disease. For the past twenty years or so, I would see scores of horses fall victim to spring time laminitis from spring grass ingestion. A large number of these cases in my area would not get treatment from vet or farrier. I'm not advocating that we do nothing to help or assist these horses at this time in laminitis. The truth is many owners with large acreage do not see their horses for some time, a week or more at least, and then it may only be from a distance. Granted, it is common knowledge that mild grass founder is less complicated and easier to manage than the more sophisticated systemic insults. Seeing these less complicated cases survive and recover on their own, with only hoof distortion and minor bone changes, has provided me with information that is valuable for the treatment of the more complicated cases. It's quite easy to recognize a foot that has had laminitis, by the dorsal hoof wall growing forward and heels growing tall, etc. They all seem to respond to the disease in the same manner, with regards to the way the foot changes shape. The hoof that distorts and changes shape during the disease process holds a treatment solution for all types of laminitis cases. It has become apparent through scientific research that the foot is extremely adaptive to the stresses of trauma incurred on it. This is no different with laminitis, regardless of the severity. The consistent manner in which the hoof remodels (often termed hoof distortion) are the guidelines and the mechanics Mother Nature has provided for these patients in her treatment plan. It has become apparent through hundreds of observations that the foot remodels (not distorts) for a valid, positive reason. The remodeling process that the hoof goes through during the laminitis disease occurs to help save the life of the horse by providing protection and support to the vulnerable coffin bone within its confines. This whole idea of hoof distortion being helpful for healing must be followed to the end, through the whole natural, adaptive, remodeling process. Doing so offers us a full understanding of the value in each phase of the disease. This includes the open range environment and activity, which plays out the role of maintenance to the foot once the disease is over and the hoof is brought back to its natural shape. This is a very important part of the equation that we farriers and veterinarians must fulfill. Timing, patience and understanding the disease cycle are key ingredients in the formula for success when treating laminitis.

Horses that rotate are affected by the partial detachment of the laminae on the dorsal surface of P-3 only. The laminae in the rear, or caudal, region of the foot are involved to a lesser degree. This includes the lamina of the bars as well. The rear portion of the frog is generally the least painful of any solar surface of the foot in rotation cases. The stance most commonly seen by these patients is to stand forward on both front and hind limbs. This only seems reasonable, as the least painful part of the foot is the very back, especially the frog. In addition, the back of the foot is also least effected by laminae detachment. When these horses move they maintain the camped forward posture and choose to land and load only on the back part of the foot. The coronary band around the front of the foot will soften and have

evidence of a depression behind the wall at the hairline. This depression of softened tissue at the hairline is generally **not** noticed in the rear of the foot on horse that rotate.

Horses that are diagnosed as sinkers will have more of the laminae involved than those who are rotating, where only the laminae on the front (dorsal) hoof wall are affected. In the case of sinkers, major detachment occurs behind the widest part of the foot. The entire coffin bone is involved and is released from within the hoof capsule. Frequently the lamina at the heel buttress and bars are not as seriously involved, since the coffin bone does not extend that far back in the foot. However, the horse is still termed a sinker. In very extreme cases the heels, bars and underlying frog are equally involved. The coronary band will become very soft in the areas affected. A depression can be palpated at the top of the hoof capsule inside the hairline, well back to the heel buttress. These patients will generally stand with their limbs vertical to the ground instead of camped forward, as commonly seen with horses that are rotating. They will most frequently be more painful in the back (caudal) region of the foot, especially if they are mechanically raised in the heel without knowing that they are a sinker. Other sinkers are seen with their front legs positioned back under their body behind a vertical line. They are very reluctant to move and may fall down if vigorously encouraged. Once they are down they are just as reluctant to get up. Those horses that are termed rotating use the rear portion of their foot to bear their body's weight, which is far less sensitive than the front over the sole. Therefore, horses that are rotating are able to extend their limbs forward to get up and down and to move about some. When there is a part of a horse's foot that is less painful, they will normally choose that area to load when they have to move or stand. Sinkers have little to no choice of finding comfort, as the whole foot is painful, especially when the hoof wall has direct contact with the ground. Sinkers have always held an unfavorable to hopeless prognosis. It is reasonable to assume that these cases cannot survive, as the blood supply is severely compromised. Immediate response with the application of Styrofoam support blocks has proven to be very effective in quickly restoring blood flow to P-3 and providing protection to the vital internal structures.

In each case with horses that rotate or sink, survival and any hope for recovery is dependent on how well the coffin bone is protected and survives the disease. Restoring and maintaining blood supply to P-3 is also a major part of the survival formula. There are two "natural" procedures used for treatment, employed by the horse that we seldom consider as important in the disease treatment process. Due to the extreme pain that is incurred from the tearing, inflamed lamina, one of the natural responses is to lie down during this painful period. The horses that want to lie down should be allowed to do so until proper support to their feet can be provided. They should not be forced to walk at any time, especially without proper natural support in place. Their need to lie down is one measure they take to protect the fragile distal border of the coffin bone and help to reduce the chances of accelerating or complicating the disease in the first few days. If appropriate bedding and ground surface (sand, mud) is available, they will move the material around under the caudal part of their feet to give themselves comfort when they stand. In addition, horses in this acute stage of the disease will often eat very little or refuse to eat at all. Fasting, as we know it, serves as a cleansing for the body and helps to remove toxins. Therefore, patients are not encouraged to eat anything for 2 to 4 days, only given water. This is not far from what they naturally do in most cases.

The hoof capsule and sole are the structures that start to change immediately in the acute stage of the disease. A bulge is noticed on the sole around the apex of the frog. This corresponds with the softening of the tissue above the coronary band, as mentioned earlier. With horses that rotate, as well as most sinkers, we see an increased heel growth occur very soon in the acute stage of the disease. To compliment these changes the bars and frog begin to develop rapidly as well. The bars become very strong, well defined and will eventually connect around the apex of the frog. In a short time the frog apex will weld or unite with the bars in this area. This remodeling process starts to take place early in the disease process. The dorsal hoof wall, or whatever part of the wall that is affected by the disease insult, will move away from the dorsal surface of P-3 as a result of inflammation. The laminar attachment of P-3 to the inner face of the hoof wall is effected by the inflammatory response of the laminitis disease. If the horse is forced to bear weight on the hoof wall, increased lamina tearing will occur. The rear (caudal)

portion of the foot (heel buttress, frog and bars) that responds to the disease early, termed hoof distortion, form an intricate internal hoof structure naturally positioned inside the peripheral distal border of P-3. The arch that is formed by the bars and frog seen as prolapsing or bulging from the bottom of the foot is the natural internal framework of cushion and horn material that Mother Nature substitutes for the diseased outer hoof wall. Radiographs will show that the tip of the coffin bone will move back close to the place where the bars have joined around the apex of the frog, when markers on the dorsal hoof wall and frog apex are used. When patients collect bedding or sand under their feet to stand on, they are trying to provide themselves with support in the newly restructuring portion of the foot. When they move, their posture is feet forward with heel landing and loading in that same caudal region of the foot. The dorsal hoof wall will move out of the way or separate when there is an inflammatory reaction in the lamina. Any efforts taken to reunite the hoof wall is generally counter productive and often leads to extreme complications that will in turn lead to less than optimal results in the end. Abscesses that occur at the coronary band and through the sole of the foot are expected in serious cases and offer the patient a better chance of recovering to a higher level of soundness with a much greater future of returning to pre-disease condition. **This can only happen when proper support is given immediately to these patients in the area of the foot that is naturally redeveloping for that purpose.**

I have records of the last 30 cases that have abscessed through the coronary band and/or through the sole within a short time after the initial insult of laminitis (1 to 2 months). Our purpose was to record results of those cases whose abscesses were treated, versus those who were untreated. Over half of the abscesses were not soaked or encouraged to dry up. The abscesses at the coronary band were left uncovered. The sole abscesses were wrapped and protected from dirt and debris only. No trimming of the sole in the area of the abscess was done to encourage drainage. The wraps consisted of two layers of prepared Styrofoam blocks applied with Elasticon tape. The other cases were soaked with Epsom Salts or Betadine for 2 or 3 days. Some of those cases were cleaned of debris on the sole where the abscess came through.

There were little to no set backs in healing with those who were **untreated**. Most cases that were treated by soaking progressed slower and some had reoccurring painful periods. All of the cases that had sole material removed around the abscess site stabilized much later and had even more setbacks. All but 2 cases survived with over 70% returning to their pre-disease purpose. The abscesses associated with laminitis are the “mechanisms of debridement” and follow a cycle that seems to work well if left to follow its own course of events.

Coronary separation caused by abscesses seems to be the most beneficial attempt by Mother Nature to rid P-3 of useless necrotic material and detach the hoof wall so that a new hoof will begin to grow with minimal chance of distortion. It is important to note that the wall that abscesses and detaches at the coronary band is not ready to be removed until a later date. The wall below the area that has abscessed will loosen and be easily removed some 3 to 4 months later. Until then it will serve as a protective covering for corium preparing a new surface over the dorsal surface of P-3. Trimming the hoof wall should consist of removing only the part that would make contact with the ground ahead of the frog apex. The rapidly produced bars, frog and heels that respond to the laminitis disease will take over the job of support and protection to the fragile coffin bone (P-3). This new reinforced inner wall (the bars), cushion support and circulatory mechanism (the frog) serve as the natural substitute for the normal healthy outer hoof wall that has been detached from the lamina in the disease process. Separation of the hoof wall and P-3 in acute laminitis, termed rotation, can be looked upon as a positive event. However, if the patient is allowed to walk or stand only on the hoof wall, the laminae tearing will be accelerated **beyond what is necessary for that** laminitis event. The amount of remodeling and abscessing seems to coincide with the amount of extreme pain or minor pain. The amount of hoof remodeling that takes place also seems to parallel the severity of the disease insult. It is our nature to treat horses with this disease by reducing inflammation and treating them for pain early when the disease is in the acute stage. I support the efforts health care practitioners make by providing medication appropriate for this disease, as long as an equal effort is made to provide adequate protection and support to the coffin bone. When the comfort

level of the patient exceeds the extent of the true structural damage to the vital structures within the hoof, extreme damage and future complications can exist. However, when adequate support and protection is given during this crucial time, serious complications are held to a minimum.

The majority of patients treated with Styrofoam support blocks within the first day or two of the insult, immediately improve by at least 1 Obel grade. This means that medications are not as necessary to reduce pain and inflammation, and circulation is restored quickly and naturally. The procedure is simple and easy to apply in comparison to nailing or gluing any structure to the foot in the extremely painful period. It requires regular visits for about a week by someone that can apply, modify and reattach the support foam blocks. Procedure instructions can be found at www.hopeforsoundness.com or through EDSS, Inc. at (719) 372-7463